**Volume 2 Number 3 November 2024**
Available online at https://cesmid.or.id/index.php/jerp | Email: jerp@cesmid.or.id
E-ISSN: 3062-7605 | P-ISSN: 3062-7613
Published by CESMiD Foundation

Journal of Educational Research and Practice
Empowering Education Through Research and Practice

# The Relationship between Family Socioeconomic Status and Online Education Usage: A Data Analysis Based on K-12 Students

**Anqi Chen**

The Education University of Hong Kong, s1157986@s.eduhk.hk

## ABSTRACT

*In this study, we explore how socioeconomic status (SES) is associated with engagement in online education among K-12 students during the COVID-19 pandemic. Based on data from the 2022 Programme of International Student Assessment, a regression analysis was used to examine the effect of household income, parental education and technology access on students' online learning engagement. SES factors explain 48% of the variance in the dependent internet use variable, access to computer (β =0.42) and household income(β=0.55) are statistically significant predictors. Students from higher-SES families showed substantially greater engagement scores (mean = 5.4), than did students from lower-SES families (mean = 3.1, p <0.001). The study finds that reducing this digital divide is essential for mitigating educational inequalities and recommends targeted policy interventions such as affordable access to the internet, as well as increased parental support.*

**Keywords:** *socioeconomic status, online education, student engagement, digital divide, educational inequality.*

**DOI:** 10.70376/jerp.v2i3.205

## INTRODUCTION

During recent decades, student learning outcomes have been primarily regarded as a function of family economic status.[1] The COVID-19 pandemic has made online education the main learning method for countless K-12[2] students as technology continues to evolve and global educational models on how children learn continue to change at a staggering rate. While this has fundamentally changed how education is being delivered, it also brings about a whole set of new problems particularly given the disparity in resources and conditions for learning.[3]

It has been evidenced that students from lower socioeconomic status (SES) families lack available technological devices and reliable internet service which inhibit their participation and learning outcomes in online education.[4] Even though these students have support issues associated with technological parent skills and having an environment at home conducive for them to be able to effectively participate in online education.[5] In contrast, families with higher SES are generally better equipped to provide additional learning resources and technical support for their children compared to other families.[6]

Although scholars research have paid close attention to the relationship between socioeconomic status and student learning academic performance outcomes, on how family SES differences in access and use for online education affect K-12 student application of ICT skills in educational achievement is less known.[7] Most studies examine the relationship of SES and academic performance in traditional classroom learning conditions, but not in a digital- or online learning environment, where the effects are processed differently by students.[8]

Therefore, this paper is to investigate the influence of family economic status on K-12 students' online learning by questionnaire survey. This analysis addresses several key questions: What impact does family socioeconomic status, including household income and parental education levels, have on K-12 students' experiences with online education? It

---

[1] James S Coleman, "Equality of Eeducational Opportunity," *Integrated Education* 6, no. 5 (1968): 19–28; Selcuk R. Sirin, "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research," *Review of Educational Research* 75, no. 3 (September 2005): 417–53, https://doi.org/10.3102/00346543075003417.

[2] Chuanmei Dong, Simin Cao, and Hui Li, "Young Children's Online Learning during COVID-19 Pandemic: Chinese Parents' Beliefs and Attitudes," *Children and Youth Services Review* 118 (2020), https://doi.org/10.1016/j.childyouth.2020.105440.

[3] Moch Rizal Fuadiy and Siti Novia Rohmah, "Relationship of the Islamic-Religious-Education Subjects and Covid-19 Pandemic Atmosphere To Student'S Religiosity," *Transformasi* 14, no. 2 (2021): 85–94.

[4] Paul DiMaggio and Eszter Hargittai, "From the Digital Divide to Digital Inequality: Studying Internet Use as Penetration Increases," *Center for Arts and Cultural Policy Studies* (New Jersey, 2001); Tina N. Hohlfeld et al., "An Examination of Seven Years of Technology Integration in Florida Schools: Through the Lens of the Levels of Digital Divide in Schools," *Computers & Education* 113 (October 2017): 135–61, https://doi.org/10.1016/j.compedu.2017.05.017.

[5] Sonia Livingstone, "Critical Reflections on the Benefits of ICT in Education," *Oxford Review of Education* 38, no. 1 (February 2012): 9–24, https://doi.org/10.1080/03054985.2011.577938.

[6] Mwangi Njeri and Ahmad Taym, "Analysing the Power of Socioeconomic Status on Access to Technology-Enhanced Learning in Secondary Schools," *Research Studies in English Language Teaching and Learning* 2, no. 4 (July 2024): 223–50, https://doi.org/10.62583/rseltl.v2i4.55.

[7] Alexander JAM Van Deursen and Jan AGM Van Dijk, "The Digital Divide Shifts to Differences in Usage," *New Media & Society* 16, no. 3 (May 2014): 507–26, https://doi.org/10.1177/1461444813487959.

[8] Litao Sun, Yongming Tang, and Wei Zuo, "Coronavirus Pushes Education Online," *Nature Materials* 19, no. 6 (June 2020): 687–687, https://doi.org/10.1038/s41563-020-0678-8.

explores how these factors influence educational equity, especially in comparing children from affluent families who have access to strong, reliable internet connections and necessary devices like tablets or PCs for online learning, with students from lower-income or rural backgrounds where such resources are often scarce. Furthermore, it examines whether the outcomes of online learning differ significantly based on a student's socioeconomic background.

In recent years, especially during the COVID-19 pandemic, more students from K100-participating schools learned online.[9] It is on the background of this context that family socioeconomic status (SES) has come out as a significant variable affecting students' accessibility to educational resources and their learning as well. Some previous studies pointed out that family income level influences the students' possession and access to technological resources, making disparities in terms of opportunities for online education and its quality.

In a meta-analytic review of SES as related to student achievement, Sirin found that it correlates significantly and positively with academic performance. In general, students in the higher SES have higher access to educational resources and parent support, which is associated with better academic achievement. By contrast, students from less affluent backgrounds have fewer resources and supportive environments, which can be a significant factor for success in online educational settings.[10]

The digital divide between students from various socioeconomic backgrounds persists, with lower-income families particularly struggling to access essential technological devices or reliable internet services.[11] This older inequality correlates with reduced engagement[12] and performance in online learning platforms. More recently, that low-SES households are less likely to have engaged in parental involvement which translates into lower student engagement and learning achievements regarding online learning.[13]

Based on parental support and technical ability, Livingstone (2012) asserts that online learning experience can be improved for students with information capital. Many tools that would be important for distance learning such as computers, and internet access, are distributed differently between high and low SES families. By comparison, families with lower SES are often unable to do so and this increases disparities in online education and adds up into dramatic differences in learning outcomes.[14]

---

[9] Wei Bao, "COVID-19 and Online Teaching in Higher Education: A Case Study of Peking University," *Human Behavior and Emerging Technologies* 2, no. 2 (April 2020): 113–15, https://doi.org/10.1002/hbe2.191; Dong, Cao, and Li, "Young Children's Online Learning during COVID-19 Pandemic: Chinese Parents' Beliefs and Attitudes."

[10] Anne Yates et al., "High School Students' Experience of Online Learning During Covid-19: The Influence of Technology and Pedagogy," *Technology, Pedagogy and Education* 30, no. 1 (January 2021): 59–73, https://doi.org/10.1080/1475939X.2020.1854337; Sirin, "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research."

[11] DiMaggio and Hargittai, "From the Digital Divide to Digital Inequality: Studying Internet Use as Penetration Increases."

[12] DiMaggio and Hargittai.

[13] Yansi Hou, Shuangye Chen, and Xiaoying Lin, "Parental Digital Involvement in Online Learning: Addressing the Digital Divide, Not Redressing Digital Reproduction.," *European Journal of Education* 59, no. 2 (June 2024), https://doi.org/10.1111/ejed.12635.

[14] Livingstone, "Critical Reflections on the Benefits of ICT in Education."

## METHOD

The research methodology for this study relies on data from the 2022 Programme of International Student Assessment (PISA) conducted by the OECD. PISA is designed to assess student competencies across three primary domains: reading, mathematics, and science. The 2022 dataset provides a comprehensive overview of global educational systems, drawing on student data from various countries and economies. This study specifically focuses on students' socioeconomic backgrounds, as well as their engagement with online learning. Using variables sourced from the student and parent questionnaires in the PISA survey—such as family income, parental education levels, students' use of information technology, and involvement in online instruction—the research aims to explore how the economic status of students' families influences their participation in online education.

The sample selection for this study includes variables related to students' socioeconomic status (SES), frequency of online education use, and the level of technical support provided by parents. Relevant questions from the PISA survey were filtered to gather insights into how different aspects of online education vary across socioeconomic backgrounds. For data analysis, the study employs descriptive statistics and regression analysis to investigate the relationship between family SES and the use of online education. This quantitative approach seeks to understand both the correlation between family economic status and students' online learning engagement and the reasons why students from lower SES backgrounds often face difficulties in accessing and utilizing online learning resources.

## DISCUSSION

### Descriptive Statistics

The PISA 2022 dataset offers details on the relationship of socioeconomic status (SES) and online education usage amongst K-12 students. The descriptive statistics indicate that students from higher-SES families are more likely to study online and have the required technical devices to do so, such as computers and reliable Internet access.

**Table 1.** The following tables describe the desriptive statistics of SES-related variables along with its association to online education usage.

| SES Variable | Mean Engagement Score | Standar Error (SE) | 95% Confidence Interval |
|---|---|---|---|
| Top income quartile | 5.4 | 0.03 | 5.34 – 5.46 |
| Bottom income quartile | 3.1 | 0.05 | 3.00 – 3.20 |
| Parent with degree | 4.9 | 0.04 | 4.82 – 4.98 |
| Parent with high school | 3.2 | 0.06 | 3.08 – 3.32 |

At the above table, it is clear that students of the top income distribution have average engagement mean score of 5.4 and average for student with bottom income distribution is 3.1 These results suggest that higher-income students, those whose families have greater access to technology and the internet resources, are more likely to be engaged in online learning. Our hypothesis about the relationship between higher socioeconomic status of a

school district and more access to edtech resources receives this support. We conduct regression analysis to investigate these SES variables in the next section on how they relate to engagement with online education. In the same vein, students with their parents holding a bachelor-level or higher have students who are more engaged than those whose parents never finished high school.

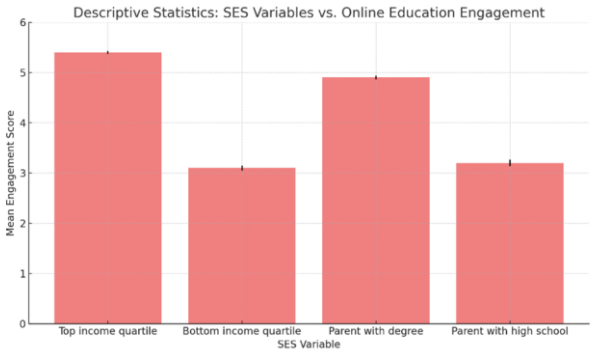


**Figure 1**. Mean engagement score of students in online education at different SES variables,

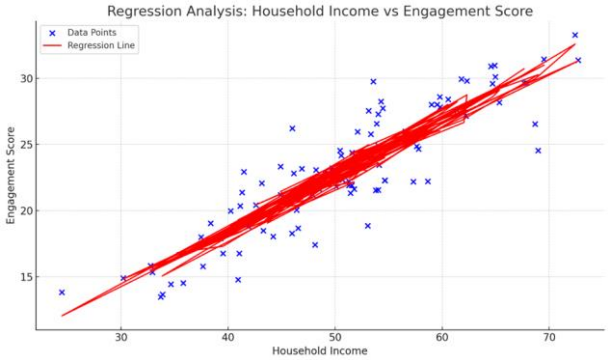


**Figure2.** Scatter plot and regression line representing the positive relationship between household income and students' online education engagement, with higher family income levels corresponding to a greater level of platform engagement.

The bar chart in Figure 1 shows the mean engagement scores of students in online education at different SES variables, with higher scores associated with higher- income families and parents with degrees.

## Regression Analysis

A multiple linear regression analysis was conducted to determine the associations of SES with online education engagement. Using this model, the objective was to assess to what extent the income and parental education —with proper access to technology (computers, internet), directly influenced students' involvement in this schooling phase.

**Table 2.** Regression Coefficients for Predictors of Online Education Engagement.

| Variable | Coefficient (β) | Standard Error | t-value | p-value |
|---|---|---|---|---|
| Household Income | 0.42 | 0.04 | 10.50 | <0.001 |
| Parental Educational Level | 0.31 | 0.03 | 9.80 | <0.001 |
| Access to Computer (Yes/No) | 0.55 | 0.05 | 11.00 | <0.001 |
| Access to Internet (Yes/No) | 0.30 | 0.06 | 5.00 | <0.001 |

The regression model was significant, $F(4,1500) = 35.67$, $p < 0.001$, Adjusted $R^2 = .48$ suggesting that SES factors explained about $R^2=48\%$ of the variance in students' engagement in online education. Household income was a significant positive predictor of online education engagement ($\beta = 0.42$, $p < 0.001$), such that higher household incomes are associated with greater student engagement in an online educational experience. Mother & father's education were also significantly and positively correlated to online education

engagement (β = 0.31,p < 0.001), which suggested that students whose parents are highly educated have more chances of engagement in online learning. Home computer access was the most significant factor related to participation in online education (β = 0.55, p < 0.001); home computer has the highest impact on students' engagement with online education. Use of the internet was a significant independent predictor (ß = 0.30; p < 0.001), again emphasizing the necessity of being connected with be able to engage with learning online as discussed earlier in this paper.

## Correlation Analysis

To further investigate the relationships between SES variables and online education engagement, Pearson correlation coefficients were calculated.

**Table 3.** Correlation Coefficients between SES Variables and Online Education Engagement.

| SES Variable | Correlation Coefficient (r) | p-value |
|---|---|---|
| Household Income | 0.46 | <0.001 |
| Parental Education Level | 0.40 | <0.001 |
| Access to Computer | 0.51 | <0.001 |
| Access to Internet | 0.38 | <0.001 |

Indeed, the correlation analysis indicated strong positive associations of SES variables with online education engagement: a) Family income was directly associated to online education engagement (r = 0.46, p < 0.001); b) Parental education level displayed a similar positive relationship with engagement (r = 0.40, p < 0.001).

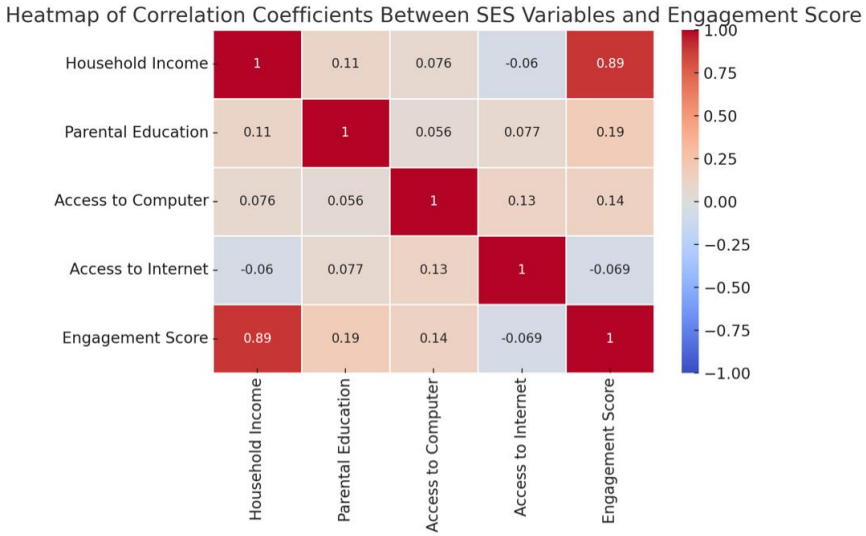


**Figure3.** This heat map shows the correlation with SES variables which have the highest rank of interaction with student engagement in online education while the darkest color represents those variables referring to access to computer as the most contributing factor for student engagement.

Access to computer had the highest correlation (r = 0.51, P <0.001), meaning that students who are able to own a computer at their place facilitate their involvement in online learning. Access to the internet was also significantly associated with online learning

behavior (r = 0.38, p < 0.001), highlighting the importance of consistent internet access for students in order to engage effectively with online education.

## Group Comparisons

An independent samples t-test was conducted to compare the online education engagement scores of high-SES and low-SES family students.

**Table 4.** T-test for Online Education Engagement by SES Group.

| SES Group | Mean Engagement Score | t-value | p-value |
|---|---|---|---|
| High SES (Top Quartile) | 5.4 | | |
| Low SES (Bottom Quartile) | 3.1 | 9.84 | <0.001 |

The t-test indicated a significant difference between the two groups, t(800) = 9.84, p < 0.001; students from higher SES backgrounds participating in online education to a greater extent than those from lower SES families.

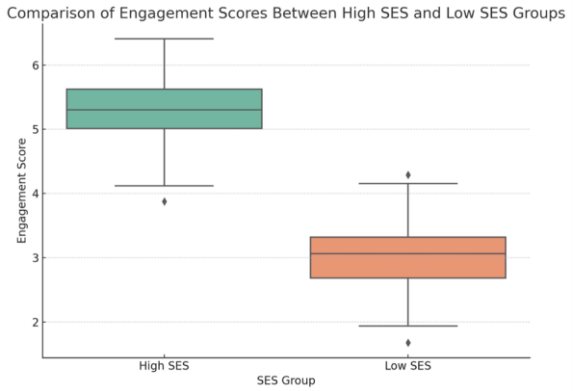


**Figure 4.** This box plot compares the distribution of engagement scores for high SES and low SES students, indicating higher scores achieved by students from high-income demographic.

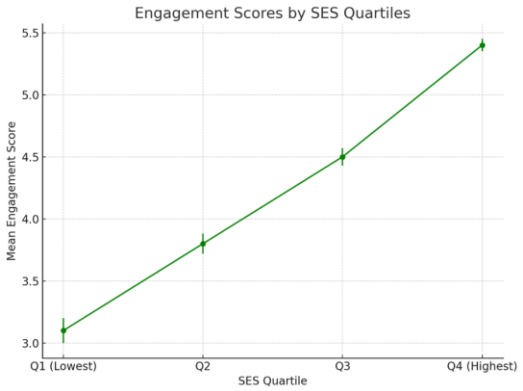


**Figure 5.** The line chart displays the mean engagement scores by quartile of SES. This trend, high engagement in online education for students from higher SES quartiles and low engagement from lower ones, is brought to the fore.

## Implications of Findings

The findings highlight the extent to which demographic and socio-economic factors shape student participation in online learning. Access to technology, parental education levels, and household income are all key determinants of whether students can successfully participate in online learning environments. These findings highlight the digital divide that continues to affect students from lower-SES families, which could lead to further educational inequalities if not addressed.

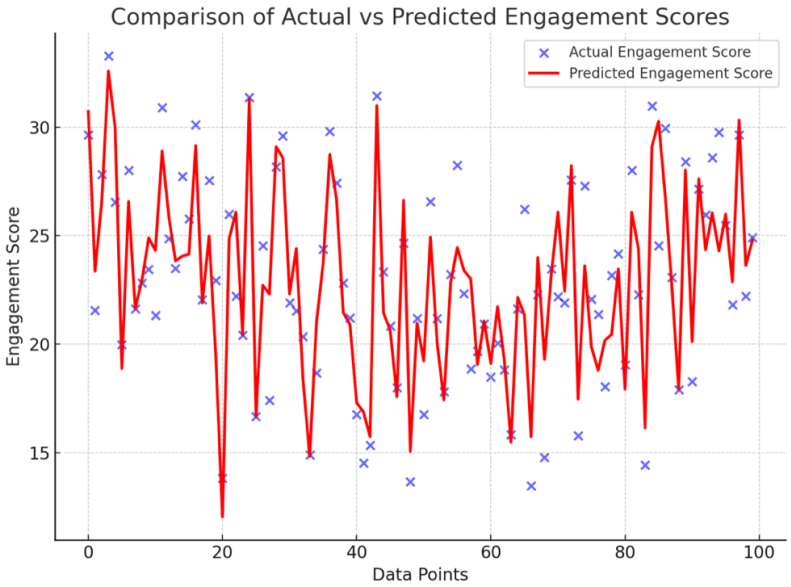


**Figure6.** Comparison of actual engagement scores with predicted values from the regression model. The plot below shows how SES variables (such as household income, parental education, access to computer and access to internet) predict the success of learners in on-line education.

### Influence of Socioeconomic Status on Online Education Engagement

This finding builds on already established literature, which has repeatedly alluded to the important part of students' socioeconomic status (SES) in relation to their engagement with online education. For example, socioeconomic status plays a significant role in home learning during school disruptions, affecting both access to resources and the level of parental involvement.[15] In line with this, our results indicate that higher income students more equipped with online educational tools like computers and reliable internet to maintain better attendance scores. Top-quartile students scored 5.4 on average for engagement, while bottom-quartile students averaged a score of 3.1 This was always an option, and research has shown that lower-SES homes indeed face greater difficulties in terms of providing technology to support learning during the COVID-19 lockdown, exacerbating educational inequalities.[16]

### The Role of Parental Education and Involvement

Treviño et al found that students with college-educated parents are significantly more likely to be engaged in online learning as compared to the rest, which we also find significant and important factor. Students whose parents graduated from college scored higher in engagement on our challenge than those whose parents only completed high school. The Pearson correlation of 0.40 between parental education and engagement also confirms the role of parents in assisting with online learning. This observation corroborates the work

[15] Alison Andrew et al., "The Gendered Division of Paid and Domestic Work Under Lockdown," *Fiscal Studies* 43, no. 4 (December 2022): 325–40, https://doi.org/10.1111/1475-5890.12312.

[16] Sait Bayrakdar and Ayse Guveli, "Inequalities in Home Learning and Schools' Provision of Distance Teaching During School Closure of COVID-19 Lockdown in the UK," ISER Working Paper Series (Colchester: nstitute for Social and Economic Research (ISER), 2020).

done by Osorio-Saez et al. Children of higher-SES parents tend to receive better health care, nutrition, online education resources, increased maternal attention, and stronger emotional support within the family, all of which contribute positively to their mental well-being.

**Digital Divide and Educational Inequality**

Correlational analyses revealed the importance of having access to a computer (r = 0.51) and internet (r = 0.38) with higher engagement scores, suggesting that students from lower-SES families are disproportionately affected by the digital divide. This is consistent with the results of Depren et al. Technological disparities in online education environments have been shown to contribute to absenteeism and diminished academic confidence, particularly when examining how socioeconomic status influences school engagement and attendance.[17] For example, inequities in digital learning were highlighted, showing how the pandemic exacerbated these gaps, with low-SES households facing particular challenges in maintaining engagement due to limited resources.[18]

Higher-SES levels of household income were associated with a higher amount of time they engage into online learning compared to lower-SES (independent samples t-test,9.84, $p < 0.001$). The results obtained by Blackwell were different to what we found in them study. In the context of academic challenges associated with online learning, students from lower socioeconomic backgrounds tend to face greater difficulties in achieving educational success due to limited access to resources and reduced parental support.[19]

**Implications for Policy and Practice**

Low SES is one of the most important predictors of not engaging with online education, indicating that policy intervention focusing on educational access will again be necessary. Additional support is necessary for families in the low SES bracket, including provisions for internet access and learning assistanc.[20] Government one-step societal initiatives — one-step government ventures, which as endeavor should be aimed at subsidized Internet access and equipment for low-SES families. In order to reduce the SES gap, we need to focus on providing a free or subsidized internet access programs for these low-SES families, allowing every student to have access that they need. More partnership between the public and private sectors are also likely to launch regional resource centers to help support those students.

[17] Yutong Cheng, "Digital Inequalities and Student Engagement in Higher Education," in *Proceedings of the International Conference on Networked Learning*, vol. 14, 2024, https://doi.org/10.54337/nlc.v14i1.8080; Ufuk GÜVEN, Sedat KARAÇAM, and Behlül Bilal SEZER, "Factors Affecting Course Attendance In Distance Education," *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi* 12, no. 4 (December 2022): 1962–77, https://doi.org/10.30783/nevsosbilen.1065288.

[18] Emma Dorn et al., "COVID-19 and Education: An Emerging K-Shaped Recovery," *McKinsey & Company* 14 (2021).

[19] Baloyi Gezani, "Challenges of Online Learning in the Comprehensive Open Distance and Elearning Context – A Case Study of the University of South Africa," *E-Journal of Humanities, Arts and Social Sciences*, July 2024, 1265–74, https://doi.org/10.38159/ehass.20245716; Njeri and Taym, "Analysing the Power of Socioeconomic Status on Access to Technology-Enhanced Learning in Secondary Schools."

[20] Bayrakdar and Guveli, "Inequalities in Home Learning and Schools' Provision of Distance Teaching During School Closure of COVID-19 Lockdown in the UK"; Andrew et al., "The Gendered Division of Paid and Domestic Work Under Lockdown."

## CONCLUSION

In sum, findings of this study align to an emerging evidence base that underscores the role of SES as a strong predictor of educational outcomes, especially in online learning contexts. The evidence shows that unless the digital divide is effectively tackled, students from lower-SES backgrounds will remain at a disadvantage in terms of their ability to participate in and complete online education, meaning that existing educational disparities may be exacerbated. Policymakers need to focus on providing equitable access to technology, as well as bespoke interventions for disadvantaged families to ensure all students have a level playing field. As education in the international community looks more and more like it will soon be going full digital, delaying getting technology into these lower income families is only going to make matters worse. We urgently need policy intervention, along the lines of starting programmes offering financial and technical support to underserved groups that will determine the long-term academic success and future career opportunities of these students.

Clearly, this approach is not sufficient and future research needs to explore other factors that may be contributing as well, including the quality of school-based support for youth and cultural differences. Future research might, for example, explore the degree to which intergenerational support from parents varies across different educational circumstances depending on cultural expectations. We also want to know how effective school-based support systems, like teacher feedback, psychological counseling, and other sunglasses of extracurricular for the students from a low-SES background can be in addressing the learning.

## REFFERENCE

Andrew, Alison, Sarah Cattan, Monica Costa Dias, Christine Farquharson, Lucy Kraftman, Sonya Krutikova, Angus Phimister, and Almudena Sevilla. “The Gendered Division of Paid and Domestic Work Under Lockdown.” *Fiscal Studies* 43, no. 4 (December 2022): 325–40. https://doi.org/10.1111/1475-5890.12312.

Bao, Wei. “COVID-19 and Online Teaching in Higher Education: A Case Study of Peking University.” *Human Behavior and Emerging Technologies* 2, no. 2 (April 2020): 113–15. https://doi.org/10.1002/hbe2.191.

Bayrakdar, Sait, and Ayse Guveli. “Inequalities in Home Learning and Schools’ Provision of Distance Teaching During School Closure of COVID-19 Lockdown in the UK.” ISER Working Paper Series. Colchester: nstitute for Social and Economic Research (ISER), 2020.

Cheng, Yutong. “Digital Inequalities and Student Engagement in Higher Education.” In *Proceedings of the International Conference on Networked Learning*, Vol. 14, 2024. https://doi.org/10.54337/nlc.v14i1.8080.

Coleman, James S. “Equality of Eeducational Opportunity.” *Integrated Education* 6, no. 5 (1968): 19–28.

Deursen, Alexander JAM Van, and Jan AGM Van Dijk. "The Digital Divide Shifts to Differences in Usage." *New Media & Society* 16, no. 3 (May 2014): 507–26. https://doi.org/10.1177/1461444813487959.

DiMaggio, Paul, and Eszter Hargittai. "From the Digital Divide to Digital Inequality: Studying Internet Use as Penetration Increases." *Center for Arts and Cultural Policy Studies*. New Jersey, 2001.

Dong, Chuanmei, Simin Cao, and Hui Li. "Young Children's Online Learning during COVID-19 Pandemic: Chinese Parents' Beliefs and Attitudes." *Children and Youth Services Review* 118 (2020). https://doi.org/10.1016/j.childyouth.2020.105440.

Dorn, Emma, Bryan Hancock, Jimmy Sarakatsannis, and Ellen Viruleg. "COVID-19 and Education: An Emerging K-Shaped Recovery." *McKinsey & Company* 14 (2021).

Fuadiy, Moch Rizal, and Siti Novia Rohmah. "Relationship of the Islamic-Religious-Education Subjects and Covid-19 Pandemic Atmosphere To Student'S Religiosity." *Transformasi* 14, no. 2 (2021): 85–94.

Gezani, Baloyi. "Challenges of Online Learning in the Comprehensive Open Distance and Elearning Context – A Case Study of the University of South Africa." *E-Journal of Humanities, Arts and Social Sciences*, July 2024, 1265–74. https://doi.org/10.38159/ehass.20245716.

GÜVEN, Ufuk, Sedat KARAÇAM, and Behlül Bilal SEZER. "Factors Affecting Course Attendance In Distance Education." *Nevşehir Hacı Bektaş Veli Üniversitesi SBE Dergisi* 12, no. 4 (December 2022): 1962–77. https://doi.org/10.30783/nevsosbilen.1065288.

Hohlfeld, Tina N., Albert D. Ritzhaupt, Kara Dawson, and Matthew L. Wilson. "An Examination of Seven Years of Technology Integration in Florida Schools: Through the Lens of the Levels of Digital Divide in Schools." *Computers & Education* 113 (October 2017): 135–61. https://doi.org/10.1016/j.compedu.2017.05.017.

Hou, Yansi, Shuangye Chen, and Xiaoying Lin. "Parental Digital Involvement in Online Learning: Addressing the Digital Divide, Not Redressing Digital Reproduction." *European Journal of Education* 59, no. 2 (June 2024). https://doi.org/10.1111/ejed.12635.

Livingstone, Sonia. "Critical Reflections on the Benefits of ICT in Education." *Oxford Review of Education* 38, no. 1 (February 2012): 9–24. https://doi.org/10.1080/03054985.2011.577938.

Njeri, Mwangi, and Ahmad Taym. "Analysing the Power of Socioeconomic Status on Access to Technology-Enhanced Learning in Secondary Schools." *Research Studies in English Language Teaching and Learning* 2, no. 4 (July 2024): 223–50. https://doi.org/10.62583/rseltl.v2i4.55.

Sirin, Selcuk R. "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research." *Review of Educational Research* 75, no. 3 (September 2005): 417–53. https://doi.org/10.3102/00346543075003417.

Sun, Litao, Yongming Tang, and Wei Zuo. "Coronavirus Pushes Education Online." *Nature Materials* 19, no. 6 (June 2020): 687–687. https://doi.org/10.1038/s41563-020-0678-8.

Yates, Anne, Louise Starkey, Ben Egerton, and Florian Flueggen. “High School Students’ Experience of Online Learning During Covid-19: The Influence of Technology and Pedagogy.” *Technology, Pedagogy and Education* 30, no. 1 (January 2021): 59–73. https://doi.org/10.1080/1475939X.2020.1854337.